

## WHAT IS CLAIMED IS:

1. An ink-jet printing head comprising a flow-passage unit and an actuator unit laminated on each other, said flow-passage unit having nozzles and pressure chambers communicating with said nozzles, respectively, and said actuator unit being operable to apply pressure to ink in each pressure chamber, and wherein each of said pressure chambers communicates at one of opposite longitudinal ends thereof with a corresponding one of said nozzles, and at the other of said opposite longitudinal ends with an ink supply source, and is formed so as to be open in one of opposite surfaces of said flow-passage unit, such that said each pressure chamber is partially defined by said actuator unit, wherein each of said pressure chambers has a depth of  $35\text{ }\mu\text{m}$ - $45\text{ }\mu\text{m}$  in a direction perpendicular to said one of opposite surfaces of said flow-passage unit.

2. The ink-jet printing head according to claim 1, wherein said flow-passage unit includes a first plate through which said pressure chambers are formed, a second plate formed with said ink supply source, and a third plate formed with said nozzles, said first plate being fixed to said actuator unit and said second plate being sandwiched by said first and third plates.

3. The ink-jet printing head according to claim 2, wherein said actuator unit includes a plurality of piezoelectric

sheets that are stacked while sandwiching a plurality of individual electrodes and a common electrode alternately, said actuator unit having a plurality of active portions that are defined over said respective pressure chambers by said stacked individual electrodes and said common electrodes and are deformable to apply the pressure to the ink in said respective pressure chambers.

4. The ink-jet printing head according to claim 1, wherein said depth of said each pressure chamber is selected within a range of 37  $\mu\text{m}$ -43  $\mu\text{m}$ .

5. The ink-jet printing head according to claim 1, wherein said depth of said each pressure chamber is selected within a range of 38  $\mu\text{m}$ -42  $\mu\text{m}$ .

6. The ink-jet printing head according to claim 1, wherein said depth of said each pressure chamber is selected within a range of 39  $\mu\text{m}$ -41  $\mu\text{m}$ .

7. The ink-jet printing head according to claim 1, wherein said each pressure chamber has a width of 150  $\mu\text{m}$ -300  $\mu\text{m}$  in a direction perpendicular to a longitudinal direction thereof in which said opposite longitudinal ends are opposed to each other.

8. The ink-jet printing head according to claim 1,

wherein said each pressure chamber has a length of 1.0 mm-4.0 mm in a longitudinal direction thereof in which said opposite longitudinal ends are opposed to each other.

9. The ink-jet printing head according to claim 1, wherein said depth of said each pressure chamber is about 40  $\mu\text{m}$ .

10. The ink-jet printing head according to claim 9, wherein said each pressure chamber has a width of about 250  $\mu\text{m}$  in a direction perpendicular to a longitudinal direction thereof in which said opposite longitudinal ends are opposed to each other, and a length of about 1.8 mm in said longitudinal direction, said ink-jet printing head being capable of ejecting droplets of the ink from said nozzles at a velocity of about 9 m/sec. when said actuator unit is driven at a maximum drive frequency of about 24 kHz with a drive voltage of about 20.5 V.